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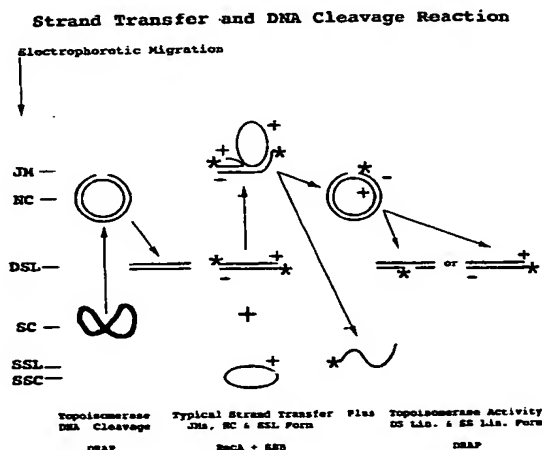
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(54) Title: DROSOPHILA RECOMBINATION-ASSOCIATED PROTEIN AND METHODS FOR USE



(57) Abstract: The invention encompasses Drosophila Recombination Associated Protein (DRAP) isolated from *D. melanogaster* and a nucleic acid sequence encoding DRAP. The Drosophila Recombination Associated Protein, its homologues from other organisms or active peptides derived therefrom, as well as DNA encoding such protein are useful for homology-dependent pairing of three DNA strands. The combination of strand-transfer and topoisomerase activities associated with DRAP permits directed pairing and cleavage at defined site(s) within DNA. This in turn makes possible the isolation and/or removal of a defined segment of DNA. DRAP is also useful in cloning, genomic cloning and gene mapping, in promoting gene disruptions or "knockout" mutations, in carrying out targeted mutagenesis of specific genes and in generating transgenic animals. The invention further encompasses a method for experimental and therapeutic application of DRAP driven knockouts or other modifications of genes responsible for genetic diseases as well as the use of DRAP driven genetic manipulation of genes in gene therapy.

WO 01/07627 A1